NON-PUBLIC?: N
ACCESSION #: 8807060159
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Plant Hatch, Unit 2 PAGE: 1 of 7

DOCKET NUMBER: 05000366

TITLE: Main Turbine Electrohydraulic Control Fluid Pressure Transient Results In Reactor Scram
EVENT DATE: 05/29/88 LER #: 88-018-00 REPORT DATE: 06/27/88

OPERATING MODE: 1 POWER LEVEL: 047

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Steven B. Tipps, Manager Nuclear Safety and Compliance, Hatch
TELEPHONE #: 912-367-7851

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TQ COMPONENT: PCO MANUFACTURER: G080
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On 5/29/88 at approximately 1002 CDT, Unit 2 was in the run mode at an approximate power level of 1140 MWt (approximately 47 percent of rated thermal power). At that time, plant operations personnel were performing a normally scheduled main Turbine Control Valve (TCV EIIS Code JJ) surveillance. During procedure performance, a full reactor scram occurred. This was an unanticipated actuation of the Reactor Protection System (RPS EIIS Code JC).

The root cause of this event is thought to be a failure of the disc dump valve associated with TCV 2 to seat properly following actuation of the TCV during testing. The failure of the disc dump valve to seat properly is believed to be the result of normal wear.

Corrective action for this event included: 1) installing orifices to reduce pressure transients in the Electro Hydraulic Control (EHC EIIS Code TQ) oil manifold and 2) scheduling repair or replacement of disc dump valves during the next refueling outage.

(End of Abstract)

A. REQUIREMENT FOR REPORT

This report is required per 10 CFR 50.73 (a)(2)(iv), because an unplanned actuation of the Reactor Protection System (RPS - EIIS Code JC) and the Primary Containment Isolation System (PCIS - EIIS Code JM) valve group 2 occurred.

B. UNIT(s) STATUS AT TIME OF EVENT

1. Power Level/Operating Mode

Unit 2 was in steady state operation at an approximate power level of 1140 MWt (approximately 47 percent of rated thermal power). The reactor mode switch was in the run position.

2. Inoperable Equipment

There was no inoperable equipment that contributed to this event.

C. DESCRIPTION OF EVENT

1. Event

On 5/29/88 at approximately 0945 CDT, Operations personnel were performing procedure 34SV-C71-005-2S (Turbine Control Valve Fast Closure Instrument Functional Test). This procedure is a normally scheduled surveillance that verifies, among other items: 1) the closure response of the main Turbine Control Valves (TCVs EIIS Code JJ), and 2) that the RPS logic functions as designed when the TCVs fast close (i.e. a half scram is inserted in the appropriate RPS channel).

At 0955 CDT, Operations personnel had satisfactorily completed testing of TCV 1. Personnel began testing of TCV 2. As anticipated as a result of the testing, the RPS channel A tripped. This half scram signal occurred at approximately 1002 CDT.

With the RPS channel A still in the tripped condition due to the TCV testing, the RPS channel B also tripped. Operations personnel did not receive any annunciators or process computer printout that indicated the reason for the RPS channel B trip. The full RPS logic actuation resulted in a reactor scram.

As expected because of void collapse due to the scram, the reactor water level decreased. When water level reached approximately 12.3 inches above instrument zero (Water Level 3) a PCIS valve Group 2 isolation occurred, per design. The lowest level reached during the event was approximately 8 inches below instrument zero (156 inches above top of Active Fuel (TAF
) at approximately 1030 CDT.

The Reactor Feed Pump "B" (RFP - EIIS Code SJ) sensed the decrease in reactor water level and automatically increased injection flow rate to quickly restore level. Reactor water level reached approximately 56 inches above instrument zero and the RFP tripped automatically, per design, on the high reactor water level signal.

The NRC was notified of this event, per 10 CFR 50.72 reporting requirement at approximately 1104 CDT.

The reactor was then maintained in a stable condition by injecting water using the Control Rod Drive System (CRD - EIIS Code AA) and rejecting water to the condenser with the Reactor Water Cleanup System (RWCU - EIIS Code CE).

2. Other Systems Affected

No systems, other than the RPS and the PCIS valve Group 2 were affected by this event. These systems have no secondary function.

3. Method of Discovery

Licensed plant operations personnel noted the full logic actuation of the RPS, the resulting scram, and the PCIS actuation by observation of control room indications.

4. Operator Actions

Operations personnel performed the following actions:

a. Performed plant procedure 34SV-C71-005-2S (Turbine Control Valve Fast Closure Instrument Functional Test).

b. Responded to plant conditions in accordance with the Emergency Operating Procedures (EOPs).

5. Auto/Manual Safety System Response

The RPS and the PCIS valve Group 2 actuation occurred automatically, per design.

D. CAUSE OF EVENT

1. Immediate Cause

The immediate cause of this event was an unanticipated trip of the RPS channel B, while RPS channel A was tripped (as a result of TCV testing). The TCV testing was being performed per plant procedures. With both RPS channels A and B tripped, a full reactor scram occurred.

2. Root/Intermediate Cause

The intermediate cause is thought to be a pressure transient in the Electro Hydraulic Control (EHC EIIS Code TQ) oil manifold that caused the RPS to sense a false TCV closure in the B channel. This sensed TCV closure caused the RPS channel B to trip.

The root cause of this event is believed to be the failure of the TCV 2 disc dump valve to reseat properly following reopening of the control valve during the surveillance test. During the surveillance test, a push button on the main turbine control panel is depressed, which actuates a fast acting solenoid valve. This causes EHC fluid to be vented from the bottom of the disc dump valve. As fluid pressure is relieved, a spring opens the disc dump valve. Opening of the disc dump valve vents the EHC fluid which is holding the turbine control valve open and consequently the control valve closes rapidly by the force of a spring.

Once it is verified that the proper RPS actuation has occurred following TCV closure, the test push button is released and EHC fluid is thus reapplied to the bottom of the disc dump valve. In this event, the disc dump valve for TCV 2 probably did not properly reseat immediately, which would cause a momentary pressure fluctuation in the EHC fluid supply manifold. This pressure transient could be of sufficient magnitude to be sensed by EHC system pressure switches which input to the RPS B channel.

Since the half scram signal in the RPS A channel initiated by the closure of TCV 2 had not been reset, the RPS actuation signal initiated by the EHC fluid system pressure transient completed the full scram logic. It should be noted that the entire sequence of events described above occurred in approximately 1.5 seconds.

E. ANALYSIS OF EVENT

The RPS provides timely protection against the onset and consequences of conditions that could threaten the integrities of the fuel barriers and the nuclear system process barrier.

In this event, the initial RPS actuation occurred when RPS channel B tripped unexpectedly while RPS channel A was in a tripped condition due to testing of the TCVs. Although the input signals to the RPS were not reflective of actual plant conditions (specifically, fast closure of the turbine control valves), the RPS functioned conservatively, as designed.

The turbine control valve fast closure scram anticipates the pressure and neutron flux increase that could result from fast closure of the turbine control valves. The RPS initiates a scram when fast closure of the control valves is initiated by the fast acting solenoid valves in rapidly reducing hydraulic control oil pressure at the main turbine control valve actuator disc dump valves. This loss of pressure is sensed by pressure switches whose contacts form the one out of two taken twice logic input to the RPS.

The PCIS provides timely protection against the onset and consequences of accidents involving the gross release of radioactive materials from the fuel and nuclear system process barrier (such as the reactor vessel). This protection is

accomplished by the isolation of process lines that penetrate the primary containment. The isolation function not only prevents the release of radioactive materials, but can also aid in the conservation of reactor inventory.

In this event, the PCIS valve Group 2 isolated, per design, on a low reactor water level signal (Water Level 3). The low reactor water level occurred as a result of void collapse immediately after the scram. This decrease in reactor water level was an anticipated occurrence.

Based on the above information, it is concluded that this event had no adverse impact on nuclear plant safety. Additionally, the above analysis is applicable to all power levels. As such, it is not believed that the consequences of this event would be more severe at other operating conditions.

F. CORRECTIVE ACTIONS

The corrective actions for this event included:

1. Installing orifices on the relayed hydraulic fluid trip system inlet to the fast acting solenoid valves. These orifices will reduce the pressure transient in the EHC oil manifold header when the fast acting solenoid valves are operated.

2. Scheduling the repair or replacement, as needed, of the disc dump valves associated with the TCVs. This will occur as part of the normally scheduled work load during the next refueling outage.

G. ADDITIONAL INFORMATION

1. FAILED COMPONENT(s) IDENTIFICATION

MPL (Plant Index Identifier): 2N11-F011A
Manufacturer: General Electric
Model Number: 119C913G0001
Type: Disc Dump Valve
EIIS: TQ

2. PREVIOUS SIMILAR EVENTS

There have been two events similar to the one described in this LER. They were reported in LER 50-366/1987-003 (dated 1/26/87) and LER 50-366/1988-011 (dated 5/16/88).

LER 50-366/1987-003 describes an event where a test procedure step was in progress that, in conjunction with an unexpected equipment failure, caused closure of the MSIVs and a reactor scram since the reactor was in the run mode.

The root cause of the event was equipment failure (a temperature switch monitor). The corrective actions included replacement of the temperature sensor and revision of the test procedure involved.

However, the corrective actions for this event would not have prevented the event described by LER 50-366/1988-018 because the cause of the similar event was different.

LER 50-366/1988-011 describes an event with the same initiating circumstances as the event reported. As a result of that unanticipated trip of the RPS trip system the following corrective actions were taken: 1) reviewing the TCV surveillance procedure, 2) functionally testing the RPS trip inputs, 3) inspecting RPS relay panels, 4) performing voltage checks, and 5) requesting Architect Engineer (AE) assistance in investigating the event.

The corrective actions for the above event did not prevent the event described in the LER since the investigation dealt with RPS and the root cause found was associated with the turbine.

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SL-4864
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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

PLANT HATCH - UNIT 2
NRC DOCKET 50-366
OPERATING LICENSE NPF-5
LICENSEE EVENT REPORT
MAIN TURBINE ELECTROHYDRAULIC CONTROL FLUID
PRESSURE TRANSIENT RESULTS IN REACTOR SCRAM

Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv), Georgia Power Company is submitting the enclosed Licensee Event Report (LER) concerning the unanticipated actuation of some Engineered Safety Features (ESFs). The event occurred at Plant Hatch - Unit 2.

Sincerely,

/s/ W. G. HAIRSTON, III
W. G. Hairston, III
Senior Vice President

BF/ct

Enclosure: LER 50-366/1988-018

c: (see next page)

ATTACHMENT # 1 TO ANO # 8807060159 PAGE: 2 of 2

Georgia Power

U. S. Nuclear Regulatory Commission
June 27, 1988
Page Two

c: Georgia Power Company

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Mr. L. T. Gucwa, Manager Nuclear Safety and Licensing
GO-NORMS

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